Department of Laboratory Animal Resources

Stabilization/Acclimation Times for Research Animals

Research animals transported from outside the institution are expected to experience mild to moderate stress. This stress results from changes in the environment, fluctuations in temperatures during transportation, short-term food and water deprivation, noise, or other physical aspects of shipping. Elevated serum corticosteroid concentrations are often seen following transportation, and a return to normal corticosteroid levels can be used to establish acclimation periods.

Stress associated with transportation has widespread effects on physiological systems in laboratory animals, including changes in the cardiovascular, endocrine, immune, central nervous and reproductive systems. Although relatively short-lived, these changes can confound research if animals are utilized before homeostasis is restored and physiological measures return to normal. Therefore, some period of acclimation following transportation is generally suggested to restore homeostasis.

The literature documents elevated heart rate and weight loss, as well as elevated concentrations of adrenaline, noradrenaline, glucose, cortisol, free fatty acids, and beta-hydroxybutyrate. Carbohydrate, protein, and lipid metabolism (both lipolysis and lipogenesis) are altered, and plasma osmolality, albumen, protein, and packed-cell volume increase. Neutrophilia and lymphopenia are also evident. These measures generally return to baseline within 1 to 7 days of transportation, although animals that are young, severely stressed, and have stress-sensitive genotypes may show altered physiological measures for several weeks. Other measures such as circadian rhythm and reproductive performance may take weeks to months to normalize. ¹, ²

F344/N rats, for example, have been shown to exhibit a variety of hematologic, serum chemistry and cytochrome P450 alterations after shipping compared to values obtained after 12 days of stabilization. Significant differences were also detected in ratio of total kidney weight to body weight, segmented neutrophil count, monocyte count, eosinophil count, and serum cholesterol, serum potassium, serum aspartate transaminase, and serum lactate dehydrogenase values.³

The Guide for the Care and Use of Laboratory Animals stipulates that "...newly received animals should be given a period of physiologic, behavioral, and nutritional acclimation before their use... The need for an acclimation period has been demonstrated in mice, rats, guinea pigs..." ⁴

In addition to allowing the animal a period of time to acclimate to its new surroundings, this time will also be used to screen the animal's health status. Most of these animals are shipped in a healthy condition; however, transportation can expose animals to potential pathogens or exacerbate subclinical infection. Therefore, this time should help allow for any potentially infectious conditions to be identified and/or treated. Exposure to adventitious pathogens can negatively alter research results.
The length of time for acclimation will depend on the type and duration of animal transportation, the species involved, and the intended use of the animals. This is considered to be a minimum amount of time to allow for a period of initial physiologic, behavioral and nutritional acclimation a minimal period of three days, excluding the day of arrival, will be needed to evaluate the animal and allow the animal to acclimate to its new environment. The researcher should evaluate whether additional acclimation time would be necessary and appropriate.

In accordance with USDA policy, entrance physical exams are required on all USDA-regulated animal species (e.g., rabbits, guinea pigs, dogs, pigs) prior to their use in research or teaching activities. These exams will be conducted by DLAR staff during the first 48 hours whenever possible. The minimum stabilization period for USDA regulated species is 7 days.

Animals intended for limited terminal experiments or tissue collection may be used prior to the end of this acclimation period following consultation with the veterinary staff. Such variances should be stated in the written IACUC protocol. Animals may be excluded from coverage of this guideline and utilized during the stabilization period for the following reasons:

A. Animals are to undergo immediate terminal procedures for tissue collection.

B. PI provides justification explaining why stabilization is not necessary for their approved animal use.


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